

MICROSTRUCTURAL INVESTIGATION OF TREATED OIL PALM SHELL LIGHTWEIGHT CONCRETE

Swamy nadh Vandanapu and Muthumani Krishnamurthi

Vellore institute of technology, India

Oil palm shells (OPS) are lightweight and for the purpose of waste utilization from oil palm industries this can be used as coarse aggregate replacing existing granite based aggregate. But the gain of strength depends on bonding characteristics at microstructural level between constituent materials. In addition, oil palm shell absorbs water 24% higher than that of conventional aggregate. Hence, oil palm shell should be treated before use in concrete as aggregate to decrease the water absorption. In this study, microstructural investigation is carried out on lightweight concrete made with treated and untreated oil palm shells. The internal structure of OPS is having pores with sizes ranging from 0.23 μm to 10 μm . When water repellent coating is coated on the surface of the OPS as treatment, water repellent coating acts as hydrophobic layer on the aggregate and fills the pores. Microstructural analysis is carried out for both the treated and non-treated OPS and bonding between aggregate phase and matrix phase is observed in both the cases. For observing the morphology and mineralogical properties of these treated and non-treated OPS aggregates, scanning electron microcopy (SEM), X-ray diffraction (XRD) analysis is carried out.